government to work toward providing the public and the environment that extra protection needed to guard against potential risks. Naturally, prudent administration will be required so that public benefits outweigh the burdens imposed."

Overall, the conferees resolved more than 40 major differences between House and Senate versions. In general, the compromise took the shape of the House version of the bill (C&EN, Sept. 13, page 7).

The last issue to be resolved concerned the kind of authority the EPA administrator should get to "halt or limit" the production of new chemicals during a premarket notification period. □

Low-tar cigarettes: a little less harmful

The first definitive evidence that smoking low-tar and low-nicotine cigarettes reduces total death rates and deaths from lung cancer and heart disease for cigarette smokers came out last week in an American Cancer Society study. Dr. E. Cuyler Hammond presented the results of a 12-year study involving 1 million men and women at a meeting in Cold Spring Harbor, N.Y., on the origins of human cancer.

The study finds that total deaths among smokers of low-tar and low-nicotine cigarettes were 19% less than for smokers of high-tar and high-nicotine brands. Those who smoked cigarettes with medium levels of tar and nicotine had a 10% reduction in total deaths. Deaths from lung cancer were 35% less for smokers of low-tar and low-nicotine cigarettes and 11% less for smokers of medium-tar and medium-nicotine cigarettes. Smokers of brands low in tar and nicotine had a 16% reduction in deaths caused by coronary heart disease, and those who smoked brands with medium tar and nicotine a 9% reduction.

These comparisons were based on smoking habits from 1960–72 of groups matched with respect to other variables that influence death rate, such as the number of cigarettes smoked daily, age, sex, race, age at which the person began to smoke, and occupational exposure to dust, fumes, and chemicals, Hammond says.

Based on this study, Hammond calls switching from smoking high to low tar and nicotine cigarettes "a small step in the right direction for those who continue to smoke cigarettes." He points out, however, that nonsmokers fare much better than even smokers of low-tar cigarettes. The study shows nonsmokers have only two thirds the overall death rate of those who smoke low-tar and low-nicotine cigarettes and less than one sixth the death rate from lung cancer.

These data support the widely held view that it is the tar and nicotine in cigarette smoke that constitute its main hazard to health. At least for lung cancer, however, the effect may not be as simple as that. Hammond also compared smokers who get about the same amount of tar and nicotine by smoking one to 19 high-tar cigarettes per day with those who get it by smoking 20 to 39 low-tar cigarettes. Those who smoked the greater number of cigarettes had a 70% higher lung cancer death rate. □

Mortality rates are lower with low-tar cigarettes

Cause of death	Tar and nicotine level			Never smoked
	High[a]	Medium	Low[b]	
Coronary heart disease	1.00	0.92	0.86	
[illegible] cancer	1.00	0.90	0.74	0.11
[illegible]uses	1.00	0.91	0.84	0.55

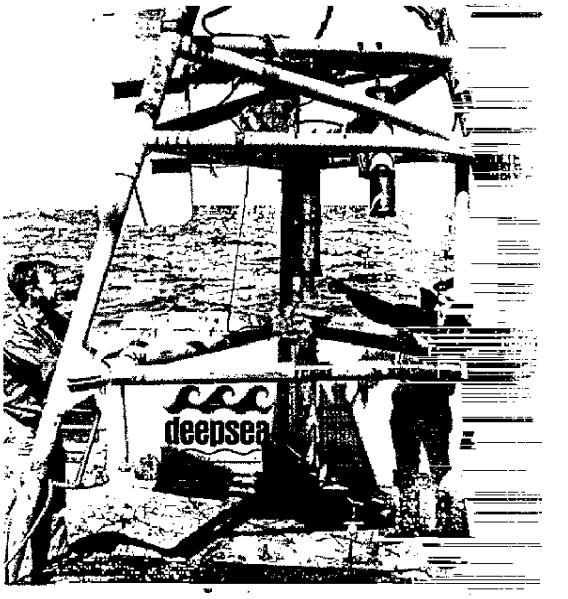
a 2.0 to 2.7 mg nicotine and 25.8 to 35.7 mg tar. b Less than 1.2 mg nicotine and usually less than 17.6 mg tar.

Law of sea stalemate stymies ocean mining

Negotiations on exploitation and regulation of seabed mineral mining, freedom of marine scientific research, and other issues have reached a state of "paralysis" and "deadlock" at the United Nations Law of the Sea Conference, which concluded its fifth, seven-week, session last Friday. In particular, developments surrounding the major obstacle to agreement on a new international ocean treaty—seabed mining—have been a "disaster" for the U.S., with "absolutely incompetent handling of negotiations for six years" by the U.S. delegation resulting in a "giveaway" of almost all U.S. positions for "almost nothing in return."

This bleak consensus emerged from a symposium held last week in Washington, D.C., at Oceans '76, a conference sponsored by the Marine Technology Society and the Institute of Electrical & Electronics Engineers. Leading industry executives, lawyers, and government officials agree that matters have reached a crucial decision point, with some calling current U.S. policy "bankrupt."

Deepsea Ventures, Kennecott Copper Corp., and other ocean mining companies also are at a "critical



Deepsea Ventures launches television camera to survey seabed nodules

decision point," stress Arnold Rothstein, a Deepsea vice president, and Marne Dubs, director of Kennecott's ocean resources department. The companies have completed initial R&D on mining from ocean depths of manganese nodules—containing nickel, copper, cobalt, manganese, and other metals. The firms now are preparing to enter more intensive and costly preproduction development, including prototype tests of nodule recovery equipment at sea and transportation to shore, running of scaled-up ore processing units, and test marketing of nodule metals. This might result in commercial production by 1981 to 1983.

However, investment of $50 million to $150 million per company in the development phase may be required, and firms are reluctant to commit such funding without assurance of secure and stable access under defined conditions to mining sites, Dubs emphasizes. Such assurance does not exist without an agreed international treaty or domestic legislation.

Expectations at press time were that the UN conference would set another negotiating session for next spring. However, given the polarization between industrialized and developing countries and the latter's demands for a "new international economic order," symposium participants believe that at least three and perhaps 10 years or more will be needed for any international agreement.

The prospects are, therefore, for a vigorous push for legislation—based on bills already before Congress—to establish unilaterally a framework under which U.S. firms could start mining nodules. Symposium participants rate highly the chances of such legislation early next year. □

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